



PATENT  
Docket No. 360842003400

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of:

Akira NISHIMURA et al.

Serial No.: 09/079,468

Filing Date: May 15, 1998

For: CLOTH PREPREG AND WET  
PROCESS FOR MANUFACTURING  
THE SAME

Examiner: C. Pratt

Group Art Unit: 1771

DECLARATION OF AKIRA NISHIMURA

Assistant Commissioner for Patents  
Washington, D.C. 20231

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TC 1700

Sir:

Akira Nishimura declares under penalty of perjury under the laws of the United States of America as follows:

1. I am a national of Japan, residing at 1455, Oaza Tsutsui, Masaki-cho, Iyo-gun, Ehime 791-3120, Japan. I am a co-applicant of the invention as described and claimed in the specification of the above-identified application. I have reviewed the Office Action dated August 27, 2001. I received a bachelor's degree in Engineering in 1964 from University of Kanazawa. After graduation, I joined employment at Toray Industries, Inc (Toray). Then until 1971, I have been at Toray as a researcher in Synthetic Fiber Weaving. Since 1972, I have been involved in the development of carbon fiber woven fabrics as a pioneer in the field. I received technical awards on the development of carbon fiber fabrics from the Japan Society for

Composite Materials in 1991 and 1998. I was a Chief Research Engineer in the Composite Materials Research Laboratories of Toray and from this November I have been a Technical Adviser of the Laboratories.

2. I am familiar with the invention and disclosure of Homma, on which I am a co-inventor. Column 6, lines 47-54, of Homma relate to the "integration of the reinforced woven fabrics". The term "integration" in Homma means "integrating a plurality of reinforcing woven fabrics to each other" as stated in column 6, lines 16 and 17, of Homma. This "integration" problem of Homma and the solution of Homma of "bonding by lines" relates to stitching a plurality of reinforcing woven fabrics, *not* to incorporating a binder distributed in a line-like manner on the fabric to maintain yarn flatness as in this invention.

3. I further present this Declaration to explain that the problem solved by this invention was *not* even known or recognized prior to this invention. When the inventors of this invention first made a cloth prepreg by a wet process using a woven fabric made of thick yarns<sup>1</sup> containing *no* line-like binder, they *unexpectedly* found the following problem. They found that the yarns moved from its original position in the dry woven fabric resulting in large "openings" such that the cover factor of the prepreg was only about 75% as shown in the figures of the Comparative Example in my Declaration of May 12, 2000. I present this Declaration to show that this problem does *not* occur in a wet prepreg made of a woven fabric of 3K yarns even when there is *no* line-like binder as in the examples of Kishi.

4. Table 1 shows the properties of a 3K woven fabric (CO6343) and its wet prepreg.

Table 1

| Fabric or prepreg  | Fabric    | Prepreg   |
|--------------------|-----------|-----------|
|                    | Warp/Weft | Warp/Weft |
| Yarn interval (mm) | 2.0/2.0   | 2.0/2.0   |
| Yarn width (mm)    | 1.5/1.6   | 1.6/1.6   |
| Cover factor (%)   | 94.5      | 95.6      |

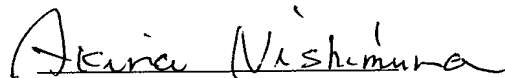
<sup>1</sup> "Thick yarns" are yarns that are thicker than the 3K yarns that were used in the examples of Kishi.

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5. The samples whose properties are shown in Table 1 are those that Mr. T. Nakanishi and Dr. R. Davé showed to Examiners Pratt and Morris at the interview of March 29, 2001. The 3K woven fabric (CO6343) is a substitute for the 3K woven fabrics disclosed in Kishi (CO7373). They have no substantial difference in the constituting carbon fiber yarns and their woven densities.

6. The 3K fabric of Kishi and its wet prepreg are shown in Photographs 1 and 2. Comparing the cover factors of the 3K fabric and its prepreg in Table 1 and Photographs 1 and 2, it is clear that the 3K fabric and its wet prepreg have almost the same "openings." Therefore, prior to this invention, a person of ordinary skill in this art did *not* even know or would have recognized that a problem of low cover factor in a wet prepreg could exist even though the woven fabric prior to prepregging has a high cover factor.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct. Executed at Otsu, Shiga, Japan, this 8<sup>th</sup> day of November, 2001.



Akira Nishimura

#25  
C. Quea  
12/17/01PATENT  
Docket No. 360842003400

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Serial No.: 09/079,468

Filing Date: May 15, 1998

For: CLOTH PREPREG AND WET  
PROCESS FOR MANUFACTURING  
THE SAME

Examiner: C. Pratt

Group Art Unit: 1771

DECLARATION OF HIROKI OOSEDOAssistant Commissioner for Patents  
Washington, D.C. 20231RECEIVED  
DEC 19 2001  
TC 1700

Sir:

Hiroki Oosedo declares under penalty of perjury under the laws of the United States of America as follows:

1. I am a citizen of Japan and reside in Seto-ryo, Oaza Tsutsui 1456, Masaki-cho, Iyo-gun, Ehime 791-03210 Japan. I received a Master's degree in organic chemistry from the Osaka University in 1983. I entered employment with Toray Industries, Inc., the assignee of this application, in 1983 and have since been engaged mainly in research and development of new materials, including reinforced composite materials. From 1983 to 1989, I worked on organic photoconductors at the Films and Film Products Research Laboratories and the Electronic and Imaging Materials Research Laboratories of Toray Industries, Inc (Toray). Subsequently, from 1989 to 1993, I was engaged in the research and development of photoresist and electron-beam

resist materials at the Electronic and Imaging Materials Research Laboratories. Since 1993, I have been engaged in the research and development of matrix resins for CFRP, CFRP prepreg manufacturing and resin transfer molding in the Composite Materials Research Laboratories of Toray. I am now a Research Associate at Toray. I am very familiar with the art of making and using high performance fiber reinforced composite materials. I am also familiar with the art of making and using preregs.

2. I have reviewed this application, the Action of August 27, 2001 and the Homma and Kishi references cited by the United States Patent and Trademark Office during the prosecution of this application. However, I am *not* an inventor named in the U.S. patent application identified above or on Homma or Kishi. I have also reviewed Mr. Nishimura's Declaration of November 8, 2001. I have studied composite materials and processing. I have invented novel composites. For example, I am the first named inventor on U.S. Pat. No. 5,985,431, entitled "PREPREG, AND A FIBER REINFORCED COMPOSITE MATERIAL." Therefore, I am knowledgeable on the subject matter of this application and of Homma and Kishi. I am also familiar with the problems encountered in the art of composite materials and the prior art solutions to those problems. Therefore, based on my education and experience, I am *a person of ordinary skill* in the art of fiber reinforced composite materials.

3. First, I present this Declaration to explain the meaning of "bonding by lines" in column 6, line 54, of Homma. To construe this phrase in *totality* of the disclosure of Homma, but not in isolation by itself, I reviewed Homma, particularly, column 6, lines 47-54, of Homma, which relate to the "integration of the reinforced woven fabrics." I construe the term "integration" in Homma means "integrating a plurality of reinforcing woven fabrics to each other" as stated in column 6, lines 16 and 17, of Homma. Homma then discloses in column 6, lines 50-54, that "since the impregnation ability of a matrix in the formation of a fiber reinforced composite material deteriorates if the reinforcing woven fabrics are bonded by surface bonding, bonding at points or bonding by lines is desirable." This disclosure of Homma means that a

plurality of woven fabrics should not be bonded by surface bonding, for example, by applying an adhesive film layer, because it deteriorates the impregnation ability of such bonded woven fabrics. Instead, Homma suggests that a preferred method for bonding woven fabrics would be "bonding by lines." I construe this phrase "bonding by lines" to mean *stitching* a plurality of reinforcing woven fabrics. I do not interpret this phrase "bonding by lines" to mean incorporating a binder distributed in a line-like manner on the fabric as in this invention, particularly, in light of the fact that Homma relates to "a preformed material formed using a plurality of the reinforcing woven fabrics." See Abstract of Homma; emphasis added. In short, Homma's problem was to integrate a plurality of reinforcing woven fabrics. Homma's proposed solution was "bonding by lines," i.e., stitching the woven fabrics. However, Homma does *not* suggest incorporating a binder distributed in a line-like manner on the fabric as in this invention.

4. Prior to this invention, the yarns used for reinforced woven fabric were generally made of 3K yarns as that used in Kishi. When a person of ordinary skill in this art made a prepreg by a wet process using a woven fabric made of 3K yarns, but *without* using a binder as in this invention, one could still produce good quality prepreg with a cover factor of about 90% more. Therefore, the problem that this invention solves was *not* even recognized by a person of ordinary skill in this art.

5. Finally, I have reviewed the results in Table 1 of Mr. Nishimura's Declaration of November 8, 2001. Based on these results, as a person of ordinary skill in this art I would *not* have recognized that a prepreg of thick yarn woven fabric made by a wet process could have a problem of low cover factor.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct. Executed at Masaki-cho, Ehime, Japan, this 30th day of November, 2001.

Hiroki Oosedo

Hiroki Oosedo

【錠を】 ～を下ろす[掛ける] fasten a lock; turn the key in the lock; lock (the door); lock up (a box). ①二重に～をかける lock double. ②～を外す[開ける] unlock. ③～を掛けておく keep (a thing) locked; ④直に～にしておく keep (have, place) (a thing) under lock and key. ⑤～を回してしま込む lock (a thing) away. ⑥～をこじあける[むき切る] force a lock; wrench away (open) a lock; open (prize off) a lock; ⑦金・釘などで pick a lock. ⑧外から～を回してある be locked from the outside. ⑨～を回す hamper a lock. ⑩～をいじり回す fumble with [at] a lock. ⑪～を回して寝る lock up for the night.

⑫～がどうしてもかからない. The lock won't catch. ⑬この戸は～がかからない. This door won't lock. ⑭あの戸は自動的に～が下りる. That door locks automatically.

2 錠剤 a tablet; a tabloid. [=jōzai 錠剤] ①ビタミン～ a vitamin(e) tablet [pill]. ②モル～ a tablet of morphine. jō [jō] 状 n. 1 (L) ①状態 condition; state; ②事情 circumstances; ③様子 appearance(s).

④彼らは～を具して警察へ訴え出た. They laid the facts of the case before the police authorities. ⑤今は何の～ぞ. What a sorry plight they have got in!

2 書状 a letter; an epistle. ①御～拝見. Your letter has been received and the contents noted.

jō [jō] 尉 n. (A) 1 ①判官 = hangan 判官.

2 翁 = okina. ①(高砂の)～と焼(炭) a Darby and Joan.

3 白灰 white ashes (of burnt charcoal).

jō [jō] 錠 n. (A) ① [=ōse 仰せ] ②有難いご～ a gracious message.

jō [jō] 乗 n. ①2～[3～, 4～]する ②数 raise to second [third, fourth] power.

-jō [-jō] 条 particle 1 [...]と(言え) although; though. ①罪人とは言え～ although he is a criminal. ②いくら馬鹿とはいへ～ fool as he is.

2 (L) [...]だから since; as; because; inasmuch as. ①かかる次第に候～ such being the case.

3 suf. ①箇条 article. ②jō 条.

jō- [jō] 定- pref. regular; permanent. ①～見世 a permanent store. ②～得意 a regular customer.

-jō [-jō] 上 suf. [...]の点から見て from the viewpoint [standpoint] of (morality); viewed in the light of (discipline); as a matter of (fact). ①教育～ from the educational point of view. ②商業～ so far as commerce is concerned; commercially. ③都合～ in view of circumstances. ④便宜～ for convenience sake. ⑤行きがかり～ by force of circumstances.

⑥すもうは青年の体育～至極うまい. Sumo wrestling is extremely helpful in the physical culture of young men. ⑦当時は軍の機密～それは公表できなかった. At that time we could not announce the fact by reason [for reasons] of military secrecy.

-jō [-jō] 状 suf. ①[手紙] a letter. ②招待～ a letter of invitation; an invitation. ③紹介[推薦]～ a letter of introduction [recommendation].

2 [...]に似た -like; -shaped; -form; in the form of (a liquid). ①状の 球～ the globe-like. ②チューブ～ the tube-shaped. ③くさび～ the cuneiform (building). ④ガス～ the gaseous; gasiform. ⑤つり鐘(鈴)～ the bell-shaped flower.

⑥氷は固体～の水である. Ice is water in a solid state.

-jō [-jō] 帖 suf. a quire (of paper). ①紙3～ three quires of paper. ②洋紙は24枚で1～になる. Twenty-four sheets of foreign paper (go to) make a quire.

-jō [-jō] 場 suf. a ground; a ring; a links (ゴルフ); a range; a track; a course. ①ゴルフ～ a golf links. ②競輪～ a cycle racing track [course]. ③曲馬～ a circus ring. ④射的～ a rifle [shooting] ground [range].

-jō [-jō] 畳 suf. the number of mats. ①1～ a mat. ②十～の間 a ten-mat room. ③四～半の部屋 a four-and-a-half-mat room. ④あの座敷は何～ありますか. How many mats does that room have? ⑤四～半です. It has four and a half mats. ⑥日本では部屋の大きさを何～敷きという. In Japan, we say a room has so many mats.

jōai [jōai] 情愛 n. affection; love. [=jō 情], [aijō 愛情] ①～の深い loving; affectionate.

jōatsu [jōatsu] 常圧 n. normal [atmospheric] pressure. ①～蒸留(化) atmospheric distillation.

jōba [jōba] 乗馬 n. 1 ①騎乗 horse(back) riding; riding. ②台(馬に乗るための踏み台) a riding block. ③～伝令使 a mounted orderly. ④～演習 riding exercises. ⑤～服 a riding dress [suit]; ⑥(婦人の) a riding habit; ⑦(俗) riding togs. ⑧～学校 [訓練所] a riding school [academy]; a manege. ⑨～靴 riding [top] boots. ⑩～歩兵 mounted infantry. ⑪～術 (the art of) riding; horsemanship; equestrian skill. ⑫～クラブ a riding club. ⑬～教官 a riding master. ⑭～道 a riding road. ⑮～むち a riding crop. ⑯～将校 a riding officer. ⑰～スポート equestrian sports. ⑱～隊 a mounted corps; a cavalcade. ⑲～用上着 a riding coat. ⑳～像 an equestrian statue [figure]. ㉑～ズボン riding [jodhpur] breeches; jodhpurs. ㉒N大将の～姿 General N on horseback; the mounted figure of General N. ㉓～suru v. ride a horse; mount [get on] a horse; ride horseback; take horse. ㉔～のいかにする take riding

lessons; ㉕[習う] learn (how) to ride (a horse). ㉖～に行く go for a ride. ㉗～で行く go on horseback. ㉘～がうまい[下手だ] sit [ride] a horse well [poorly]; be a good [poor] rider.

② ㉙[号令] To horse! / Mount! ㉚～用意! [号令] Boot and saddle! ㉛彼の～は上達しないだろう. He'll never make a good rider. ㉜彼女は～に化けている. She is at home in the saddle. ㉝あの軍人は～は下手くさだ. The soldier rides like a tailor.

2 ㉞(馬) a riding [saddle] horse; a mount; a horse (used) for riding [for the saddle]; a hack; a hackney; a palfrey. ㉟特別仕込みの～ a specially trained mount. ㊱彼の～は白毛の駒だった. He was mounted on [His mount was] a white charger.

jō-bako [jō-ba] 状箱 n. a letter [message] case.

jōban 序盤 n. the opening(s) (in the game of go [chess]).

jōban [jōban] 上番 n. (O) ①[軍] guard mounting; being on duty. ②[⇒ kaban 下番] ～suru v. mount guard; go on duty.

jōban [jōban] 上盤 n. ①(鉄山) a hanging wall; ②(土木) the upper [vernier] circle.

jōban [jōban] 定盤 n. ①(機) a surface plate [table]; a molding board. ②上～ a top board. ③締め～ a squeeze board. ④～付け plate molding.

jō-ba'sami [jō-ba] 状挟み n. a letter clip [file].

jōbatsu 除伐 n. ①(林業) improvement [salvage] cutting; clean-cutting; extraction.

jōbeki [jōbeki] 乗器 n. ①(数) a power. ②aの2[3, n]～ the second [third, n'th] power of a; a<sup>2</sup> [a<sup>3</sup>, a<sup>n</sup>].

jōben [jōben] 冗弁 n. (L) = daben.

jōbi [jōbi] 常備 n. ①～の standing; permanent; regular; ②予備 (の) reserve. ③～軍(軍隊) the standing [regular] army [squadron]. ④～兵 regular [stationary] troops; a standing army. ⑤～兵役 service with the colors and in the first reserve. ⑥～状態 (造船) the normal condition. ⑦～金 a reserve fund. ⑧～米 rice stored in a public granary; reserve rice. ⑨～炭庫 (造船) the permanent (coal) bunker. ⑩～薬 a household medicine. ㉑～suru v. ①予備する reserve (something) for (a sudden need); ②[用意して置く] have (something) ready [always available, on hand]; ③[備えつける] be provided with (something). ㉒大軍勢を～する maintain a large army.

jō-bi'raki 序開き n. an opening; a beginning; an inception.

①これを～として一同大いにしゃべった. This was a signal for those present to fall to merrymaking.

jōbitaki [jōbitaki] 上鵲 n. (鳥) a Daurian redstart; Phoenix curus aureus.

jōbo [jōbo] 醱母 n. = kōbo 醱母.

jōbō [jōbō] 状貌 n. (L) = fūbō 風貌.

jōboku [jōboku] 細墨 n. (L) 1 ①器具 an inked string for marking lines on timber. = sumi-nawa.

2 標準 a standard. ①～をもって律する measure by a standard.

jōbon [jōbon] 上品 n. ①(仏教) the Highest Paradise.

jōbu [jōbu] 丈夫 n. 1 ①(健康) good health; robustness. ㉑na

a. healthy; strong; well and strong; strong and healthy; hardy; robust; ②老人が hale and hearty.

③[丈夫に] ～になる become healthy; grow strong; gain [improve] in health; ④[回復する] be all right again; be well again; recover; recuperate. ⑤体を～にする improve [build up] one's health; fortify oneself (against a cold).

⑥[丈夫で] ～でいる be in good health; enjoy good health; be healthy; be robust; be well and strong; be alive and well. ⑦とて～である be strong as a horse.

⑧お陰様です. I'm all right [O.K.], thank you. ⑨至って～です. I am as fit as a fiddle [as right as rain]. / I'm in fine form. / I am a bull of Bashan. ⑩母はもと通りすっかり～になった. Mother is quite strong again. ⑪～なのは何よりです. Really, health is everything. ⑫彼は～な質だ. He has a strong constitution. ⑬心臓が～でない. His heart is not sound. ⑭父が～な間に伊勢参りをさせたいものだ. I wish to send my father on a pilgrimage to the Grand Shrines at Ise while he can get about. ⑮祖父は今も～です. My grandfather is still going strong. ⑯子供は田舎にいと～に育つ. Children thrive [grow strong] in the country air. ⑰～な人は病人を見るときどかしがる. The well are impatient of the sick.

2 堅牢 stoutness; toughness. ㉑na a. strong; solid; firm; substantial; durable (長持ちする); tough; coriaceous. ㉒～な布[綱] stout cloth [cords]. ㉓～にできた strongly-[solidly]-built.

④この織物は～で長持ちする. The stuff gives long wear. ⑤くつは～一方の方がよい. I prefer my shoes heavy. ⑥この靴下はかかとが特に～にできている. These socks are reinforced at the heels. ⑦この反物は～向きます. This cloth wears well [is made for wear]. ⑧～一方. Durability is the main feature. ⑨～なことはお断り合致します. I will answer for its durability. ⑩それは体裁をかまわず～一方にできている. It is made for strength and not for appearance.

jōbu [jōbu] 上部 n. 1 ①[上の部分] the upper part; the top [head] (of the page). ②～甲板間(=)場所 (造船) the upper 'tween decks. ③～飾りカット (図書) a headpiece. ④～工事 (土木) superstructure work. ⑤～線 (電信) the up line. ⑥～余白 (図書) the head [top] margin.

at it tooth and nail. ①じりじり～work one's way up (against). ②攻め行く[来る] invade; make an inroad. ③質問で攻められる face a barrage of questions (about).

**seme'ru** 責める v. ①[とがめる] call (a person) to task (account); condemn; blame; censure; charge; impeach; criticize; reproach; lay an accusation against (a person); take (a person) to task. ②約束不履行を～ reproach (a person) for breaking his promise. ③人の怠慢を～ denounce a person for his neglect of duty; blame a person for his negligence. ④人の言葉を～ take a person to task for his remark. ⑤良心に責められる be stung (convicted) by one's conscience; be tormented with the stings of conscience.

①私は違約を責められた。I was reproached with having broken my promise. ②彼は不義理を責められた。He was taxed with ingratitude. ③彼は僕が仕事を怠けたとって責めた。He accused me of having neglected my work. ④自分を責めて人を～な。Find fault with yourself rather than with others. / Be severe with yourself but lenient with others.

②[いじめ苦しめる] torture; put to torture; persecute. ③人をいろいろに責めて白状させる extort confession from a person by various means of torture.

③[きびしく催促する] urge (a person to do); press (a person for a thing); (むだる) tease (one's mother to do). (⇒ *nedaru*) ④金を払えと～ press (a person) for payment (of money). ⑤債主に責められる be tormented (hounded) by a pressing creditor; be dunned. ⑥子供に責められておもちゃを買ってやる be pestered by one's child to buy a toy for him.

④[馬を乗りならす] break in (a horse); break (a horse) to the rein. **seme-saina'mu** 責め苛む v. ill-treat; maltreat; treat cruelly; torment; torture; molest; persecute. ⇒ *semeru* 責める. **se-me-tateru** 攻め立てる v. attack repeatedly (hotly); make an incessant onslaught (on the enemy). **se-me-tateru** 責め立てる v. ①[きびしく責める] torture severely; (米俗) put the squeeze (to a person); (米俗) put the screws (on a person).

②[きき立てる] urge (a person to do). **se-me-ta'zuna** 責め手綱 n. a gag rein. **se'mete** せめて ad. at least; at most; at best; just.

①～2千円なら買うのだが。I would not give more than 2,000 yen for that. ②～もう1日お泊りなさい。Stay just one day longer. ③～そう言ってくれてよかったらうに。He might at least have told me so. ④読書が～も慰安である。Reading is his sole (only) consolation. **se-me-tei** 攻め手 n. [人] an assailant; an assaulter; [軍勢] the attacking force; [攻勢] the offensive; [手段] a means of attack; [囲碁・将棋などの手] an offensive move.

**se-me-toru** 攻め取る v. = *seme-otosu*. **se-me-tsukeru** 責め付ける v. = *seme-tateru* 責め立てる. **se-me-u'wagi** 迫り上木 n. [トンネルの] crown lagging. **se-me-yoru** 攻め寄る v. make an onslaught (on). **se-me-yoseru** 攻め寄せる v. ①敵の大軍が攻め寄せて来た。The enemy closed in on us in vast numbers.

**se'mi** 蟬 n. ①[昆] a cicada (pl. -s, -dae); a cicada; a harvest fly; a balm cricket; (米) a locust. ②～科 *Cicadidae*. ③～時雨(々) droning in chorus of cicadas. ④～取り cicada catching. [蟬の] ～の抜け殻 the cast-off shell of a cicada. ⑤～の声 the droning of a cicada. ⑥～が鳴いている。A cicada is singing.

②[小] [機] a small-sized pulley. ⇒ *kassha* 滑車. **se'mi-dokumentari-e'iga** セミドキュメンタリー映画 n. a semi-documentary (film).

**se'mi-fa'inaru** セミファイナル n. [準決勝] semifinals. **se'mi-ko'ron** セミコロ n. a semicolon. ①～をうつ put a semi-

**se'minā** セミナー n. a seminar. [colon (to)]. **se'minari** セミナリー n. a seminary. **se'mi-puro** セミプロ n. a semiprofessional; (口語) a semipro (pl. -s). ①～の semiprofessional; (口語) semipro.

**se'mi-sofuto-ka'rā** セミソフトカー n. a semisoft collar. **se'mi-torēra** [-torēraa] セミトレーラー n. a semitrailer. **se-'mo'ji** 背文字 n. [書物の] the title on the shelfback (of a book).

**Selmu** tām n. ①～学 Semitics. ②～学者 a Semitist. ③～語 Semitic. ④～語族 the Semitic languages. ⑤～人 a Semite.

**sēmu-gawa** [se'femu-] テム皮 n. chamois (leather). **se'mushi** 僂僕 n. a hunchback; a hunchback; [くる病] rickets. ①～の hunchbacked; hunchbacked; crookbacked; hunchy; rickety.

**se'n** 千 n. a thousand; [ローマ数字] M. ③3～three thousand; MMM. ④何～という生徒 thousands of students. ⑤～倍 = *senbai* 千倍. ⑥～分の1 a one-thousandth. ⑦～に一つ one in a thousand. ⑧～をもって数えられる be counted by the thousand (by the thousands).

⑧それらは何～という数に達する。They reach into the thousands. ⑨その祭には毎日何～人という人が押しかけた。People flocked in their thou-

sands to the festival every day.

**se'n** 先 n. ①[未来] the future. = *saki* 先 6.

②[さきか] priority; precedence. ③～を越す forestall; anticipate; take the initiative; steal a march on (a person); be before-hand with (a person); get the start of (a person). ④こつから手を出そうと思つたら～を越された。It was he, not I, that took the initiative.

③[以前] ①～に formerly; before; once. [先の] ～の former; previous; old; late. ①～の家 one's old (former, late) house.

④[囲碁] the first move. [=  *sente* 1] ①～で打つ make the first move (in a game of go).

**se'n** 栓 n. [戸などの] a bolt; [びんなどの] a stopper; [コルク栓] a cork; [水道・ガスなどの] a stopcock; [穴を塞ぐ] a peg; a plug; [ボートの底穴などの] a bung; [水栓] a spigot; a faucet; [たんの飲み口の] a tap; [耳につめる] an earplug. ①～で穴を塞ぐ plug up a hole.

[栓を] ～を抜く pull out a stop (bung); unstopper. ①びんの～をする stopper a bottle. ②びんになく[ゆるく] ～をする cork a bottle tightly [loosely]. ③ガス[水道]の～をあげる[しめる] turn on [off] the gas [water]. ④水道の～を一杯にあげる turn on the water spigot at full force. ⑤コルクの～をする[抜く] cork (uncork) (a bottle). ⑥耳に～をする block one's ears. ⑦耳に綿で～をする stuff cotton in one's ears. ⑧指で耳に～をする put one's fingers in one's ears. ⑨たるの～をする bung a cask.

①びんの～がかない[ゆるい]. The bottle is tightly [loosely] corked.

**se'n** 銭 n. a sen (= 1/100 yen).

**se'n** 選 n. selection; choice; [編集の] compilation; editing; composition. ①名作～ a selection of masterpieces [famous literary works]. ②[和歌・俳句などの] ～をする select; choose.

[選に] ～に入る be chosen; be selected; be accepted. ③昇任の～に入る be named for promotion. ④～に漏れる be left out of selection; be rejected; be not accepted; be not available (原稿など).

⑤これは世間にありふれた著書とは～を異にする。This cannot be classed with the common, run-of-mill works. ⑥彼らの著作と私のとは～を異にしている。Their works are of entirely different caliber from mine.

**se'n** 線 n. ①[すじ] a line; [紐・解] a stria (pl. -ae); [水準] a level. ②細い[肉太の] ～ a thin [thick] line. ③平行[交差] ～ a parallel [cross] line. ④[政策などの] 強い ～ a strong [hard] line (on Communists). ⑤～の太い政治家 a broad-minded [strong-nerved] statesman; a statesman of strong personality.

[線に] …の～に沿って along the lines of...; in line with... ⑥の～に沿って行動する hew to the line of... ⑦平等の～に沿って世界を改造する remodel the world on the principle of equality. [線を] ～を成して in a line. ⑧～を引く draw a line. ⑨(物を区別して) はっきり～を引く draw a hard line (between).

⑩いい～を行って。You are on the right track. / [相手の答が正解に近いとき] You are warm.

②[鉄道線路・航路] a line; [軌道] a track; [路線] a route. ③番～ Track Three; the third track. ④山陽～(on) the Sanyo line. ⑤長崎シヤンハイ～ the Nagasaki-Shanghai line. ⑥シベリヤ～により by the Siberian route; via [by way of] Siberia.

③[電線] a wire; a line. ④電信電話～ telegraph and telephone wires.

**se'n** 腺 n. [解] a gland. ①～分泌物 glandular secretions; excreta. ②～細胞組織 parenchyma. ③～摘除 adenectomy. ④～の移植 gland transplantation. ⑤～状の glandiform; glandular.

**-se'n** 船 suf. a ship; a vessel. ①運送～ a transport ship. ②日本の海外貿易は主として日本～で行なわれる。The foreign trade of Japan is largely carried on in Japanese bottoms.

**-se'n** 戦 suf. ①[戦争] warfare; a war; [合戦] a battle. ②近代の modern warfare. ③殲滅～ annihilation campaigns (operations).

②[競技の] a game; a match.

**se'na** 背 n. (L) = *senaka*.

**se'n-ae'inkō** 閃亜鉛鉱 n. [鉱] (zinc) blende; sphalerite; black.

**se'naka** 背中 n. ①[身体] the back. ②(婦人服など) ～のあいた open-backed; sunback(ed); backless.

[背中を] …の方へ～を向けて with [having] one's back toward [to]... ③～を向ける turn one's back (to, on). ④人の～をたたく [親愛の表現] backslap; pat a person on the back; give a person a tap on the back; [ぶつ] slap a person's back. ⑤～を流す wash one's back. ⑥(鏡などで) 自分の～を見る get one's back view. ⑦(猫が) ～を立てる arch (its) back. ⑧～を丸くする hump [hunch] up one's back.

②[うしろ] the back.

**se'naka-aiwase** 背中合わせ phr. ①～に back to back; facing in opposite directions. ②～に坐る sit back to back (with).

**se'nbai** 千倍 n. a thousand times; a thousandfold. ①～にする increase a thousandfold; increase the number [quantity] by a thousand times.

[千倍の] ～の a thousandfold (increase); of thousand times. ②～の顕微鏡 a microscope of 1,000 magnifications.

③これはそれに比べて～の大きさがある。This is a thousand times as large as that.